



Radiation Lab

Standard 3240-05 Students will investigate changes in Earth's crust and climate.

Objective 3240-0501 Model Changes in the earth's surface.

Intended Learning Outcomes

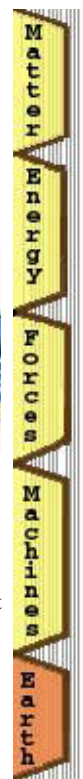
1a. Make observations and measurements.

1c. Use reference sources to obtain information.

2e. Analyze data and draw warranted inference.

2g. Construct models and simulations to describe and explain natural phenomena.

Introduction: Scientists use radioactive dating to determine how many years ago an event happened. Radioactive dating requires the use of a decay curve. In order for students to understand what a decay curve is and how to use it, the following activity is helpful. After the activity students can visit the Virtual Dating web site which allows them to use the mouse to obtain values from the decay curve in answering questions about the amount of radioactive element remaining in a substance. The process of obtaining radioactive dates from samples is also shown.



Observations:

What are the two sides of a penny called?

If you flip a penny, what are the two ways the penny can land? If you place 100 pennies in a cup, shake them up, and pour the pennies out of the cup, how many do you predict will come up heads? What are the chances of each penny coming up heads?

Problem: If every time you do the process you remove the pennies that come up heads, how many times of repeating the process will it take before all of the pennies have come up heads and are removed?



Predict an Answer (make a hypothesis):

Test the Hypothesis:

Materials:

- 1 cup
- 100 pennies
- a tray.

Procedure:

- Place 100 pennies in the cup, shake them, and pour them out into the tray.
- Remove the pennies that came up heads.
- Count the number of tails remaining and place them back in the cup.
- Repeat the procedure, until there are no tails remaining.



Test of Hypothesis data: Number of tails remaining after each trial of shaking out the pennies and taking away the heads.

Trial #	# of Tails Remaining
0	
1	
2	
3	
4	
5	
6	
7	
8	

Analyze Results: Make a graph of the data. Along the side, record the number of tails remaining, along the bottom record the trial numbers. Draw a curve connecting all the points. Give the graph a title and labels.

0	1	2	3	4	5	6	7	8	9	10	11

1. How many trials did it take for half of the pennies to have come up heads? When half of the original 100 pennies had come up heads and there were approximately 50 pennies in the cup.
2. When those pennies were dumped out, how many were left that came up heads?
3. The time it takes for half of pennies to have come up heads is called the half life. What is the half life of the pennies?
4. Imagine that it took 1000 years for you to dump out the pennies. Change all the numbers on the graph to thousands. Then use the graph to answer the following questions.
5. If there is 40% remaining, how long did it take?
6. If there is 20% remaining, how long did it take?



[Print this page](#) in Adobe Acrobat format.



Visit the [Utah State 8th Grade Integrated Science Core Curriculum Page](#).

Updated August 7, 2000 by: [Glen Westbrook](#)

[Science Home Page](#) | [Curriculum Home Page](#) | [Core Home Page](#) | [USOE Home Page](#)

[Copyright](#) © by the Utah State Office of Education.